



COURSE SYLLABUS

Engineering Materials, 6 credits

Materialteknik, 6 högskolepoäng

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|---------------|-----------------------------------|----------------------|---|
| Course Code: | TMAG14 | Education Cycle: | First-cycle level |
| Confirmed by: | Dean Apr 10, 2013 | Disciplinary domain: | Technology (95%) and social sciences (5%) |
| Revised by: | Director of Education Apr 1, 2015 | Subject group: | MT1 |
| Valid From: | Jan 1, 2016 | Specialised in: | G1N |
| Version: | 3 | Main field of study: | Mechanical Engineering |
| Reg number: | JTH 2015/1296-312 | | |

Intended Learning Outcomes (ILO)

On completion of the course, the student should

Knowledge and understanding

- have knowledge about the relationship between composition, microstructure and mechanical properties
- show knowledge about metals, polymers and ceramics
- show understanding about corrosion of metallic materials and protective mechanisms against corrosion
- show knowledge about different types of material properties

Skills and abilities

- show ability to interpret a tensile test and material failure

Judgement and approach

- show realisation about the variability of materials towards an equilibrium state and the importance of it

Contents

The course treats the basics in the relationship between structure and properties of engineering materials. The possibilities to affect properties of the engineering materials is also covered.

The course covers the following topics:

- Atomic structure and interatomic bonding
- Crystal structure and defects
- Diffusion and alloys
- Material testing, fracture and failure
- Ferrous and non-ferrous alloys
- Heat treatment of metal alloys
- Polymers
- Ceramics
- Corrosion
- Materials selection

Type of instruction

Lectures, quizzes and laboratory exercises.

The teaching is conducted in English.

Prerequisites

General entry requirements and Physics B, Chemistry A, Mathematics D or Physics 2, Chemistry 1, Mathematics 3c (or the equivalent).

Examination and grades

The course is graded 5,4,3 or Fail.

Registration of examination:

| Name of the Test | Value | Grading |
|--------------------------|-----------|---------|
| Examination ¹ | 5 credits | 5/4/3/U |
| Laboratory work | 1 credit | U/G |

¹ Determines the final grade of the course, which is issued only when all course units have been passed.

Other information

The laboratory exercises are mandatory in order to pass this course.

Course literature

Course literature is established one month before the course starts.

Materials Science and Engineering, 9th Edition SI Version

William D. Callister, David G. Rethwisch

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936 pages

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